

## CLAIMS

1. A primary cultured adipocyte for gene therapy, wherein the adipocyte stably maintains a foreign gene encoding a protein that  
5 is secreted outside of a cell.
2. The adipocyte of claim 1, wherein the gene is transferred to the cell by a retroviral vector or adeno-associated viral vector.
- 10 3. The adipocyte of claim 1, which has the ability to significantly express the protein *in vivo* for at least 20 days.
4. The adipocyte of claim 1, which is used to release the protein into the blood flow.
- 15 5. The method of claim 1, wherein the protein is insulin or glucagon-like peptide 1 (GLP-1).
6. A method of producing an adipocyte for gene therapy, wherein the  
20 method comprises the steps of:
  - (1) primary culturing an adipocyte; and
  - (2) transferring, and then stably holding a foreign gene encoding a protein that is secreted outside of the cell.
- 25 7. The method of claim 6, wherein the foreign gene is transferred by a retroviral vector or adeno-associated viral vector.
8. An adipocyte for gene therapy, which is produced by the method of claim 6 or 7.
- 30 9. An implant composition for gene therapy, wherein the composition comprises a primary cultured adipocyte, which stably holds a foreign gene encoding a protein that is secreted outside of the cell, and a pharmaceutically acceptable carrier.
- 35 10. The implant composition of claim 9, which further comprises an

extracellular matrix component.

11. The implant composition of claim 9, which further comprises an angiogenesis factor.

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12. A gene therapy method comprising the step of administering a body with a primary cultured adipocyte, which stably holds a foreign gene encoding a desired therapeutic protein that is secreted outside of a cell.

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13. A method of releasing a protein into the blood flow, wherein the method comprises the step of administering a body with a primary cultured adipocyte that stably holds a foreign gene encoding a protein that is secreted outside of the cell.

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14. The method of claim 13, which is a method for releasing the protein into the blood flow for 20 days or more.

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15. A method for lowering blood glucose, wherein the method comprises the step of administering a body with a primary cultured adipocyte, which stably holds a gene encoding insulin or glucagon-like peptide 1 (GLP-1).

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16. An animal, the body of which is implanted with a primary cultured adipocyte that stably holds a foreign gene that encodes a protein secreted outside of a cell.